SECTION  – construction progress schedule

1. General
   1. PLANNING, SCHEDULING AND MONITORING - GENERAL
      1. This section includes requirements for the preparation, monitoring, and revision of construction schedules.
      2. The purpose of the schedules and reports mandated in this section is to:
         1. Ensure adequate planning and execution of the Work by the Contractor.
         2. Establish the standard against which satisfactory completion of the project will be judged.
         3. Assist the Owner and the Consultant in monitoring progress.
         4. Assess the impact of changes to the Work.
      3. The Contractor has the obligation and responsibility at all times to plan and monitor all of its activities, anticipating and scheduling its staff, materials, plant, and work methods in a manner that is likely to ensure completion of the Work in accordance with the terms and conditions of the Contract and at a rate that will allow the Work to be completed on time.
   2. CPM SCHEDULING REQUIREMENTS
      1. The schedules required by this section shall take the form of time-scaled diagrams prepared using a computerized scheduling system, capable of producing resource-and/or cost-loaded Critical Path Method (CPM) schedules.
      2. General requirements applicable to all schedules include the ability to:
         1. Easily summarize, group, sort and filter activities by area, phase, or other categorization as applicable, or any combination thereof.
         2. Electronically compare any given schedule with any previous or subsequent update.
         3. Generate monthly progress claims and cash flow projections through resource and cost loading activities.
         4. Show schedules in bar chart, network diagram and time scaled logic diagram formats.
         5. Apply different calendars to applicable activities; and
         6. Transmit schedules electronically via e-mail attachments.
      3. Provide level of detail for project activities such that sequence and interdependency of Contract tasks are demonstrated and allow coordination and control of project activities. Show continuous flow from left to right.
      4. Float is defined as the amount of time between the earliest start date and the latest start date of an activity or chain of activities on the CPM schedule. Ensure activities with no float are calculated and clearly indicated on logical CPM construction network system as being, whenever possible, continuous series of activities throughout Contract Time to form "Critical Path".
      5. Use of float suppression techniques such as software constraints, preferential sequencing, special lead/lag logic restraints, extended activity times, or imposed dates, other than as required by the Contract, shall be cause for the rejection of any schedule submitted by the Contractor.
   3. SUBMITTALS
      1. Provide submittals in accordance with Section 01 33 00 – Submittal Procedures.
      2. Schedules shall be submitted to the Consultant in both hard copy and electronic forms. Electronic schedule submissions shall be in an original scheduling software data file type that permits modification of the layouts and data. In case of a discrepancy between an electronic copy of the schedule and the corresponding hard-copy schedule, the hard copy of the schedule that has been formally submitted and reviewed in accordance with the requirements of Section 01 33 00 – Submittal Procedures shall govern.
      3. Include costs for execution, preparation, and reproduction of schedule submittals in tendered price.
      4. Submission of the schedules referred to in this Section shall constitute the Contractor’s representation that:
         1. Contractor and its Sub-Contractors intend to execute the Work in the sequence indicated on such schedule.
         2. Contractor has distributed the proposed schedule to its Sub-Contractors for their review and comment and has obtained their concurrence.
         3. All elements of the Work required for the performance of the Contract are included. Failure to include any such element shall not excuse the Contractor from completing the Work within the Contract Time and within any other constraints specified in the Contract.
         4. Seasonal weather conditions have been considered and included in the planning and scheduling of the Work influenced by high and low ambient temperatures and/or precipitation.
         5. Contractor has thoroughly inspected the Site and has incorporated any other special conditions in planning the Work such as specified or required non-work periods, etc.
      5. Cash flow diagram:
         1. Contractor shall submit an updated cash flow diagram quarterly.
         2. Cash flow diagram shall be in format acceptable to the Owner.
         3. Cash flow diagram shall represent Contractor’s anticipated invoicing.
   4. QUALITY ASSURANCE
      1. Use experienced personnel, fully qualified in planning and scheduling to provide services from the commencement of the Work through to the issuance of the Completion Payment Certificate.
   5. PRELIMINARY AS-PLANNED SCHEDULE
      1. Meet with Owner and Consultant within five (5) working days of Contract award, to discuss proposed approach for undertaking the Work, inclusive of methodology, sequencing, Construction Equipment, and labour resources to be utilized.
      2. Prepare a detailed CPM schedule (the preliminary as-planned schedule), illustrating the Contractor’s plan for executing the Work, indicating the times for starting and completing the various stages of the Work and any applicable constraints. The preliminary as planned schedule should refine and amplify the Contractor’s tender schedule and must provide sufficient detail of the critical events and their interrelationship to demonstrate that the Work will be performed within the Contract Time.
      3. The preliminary as-planned schedule shall cover all phases of the Work and shall represent a practical plan to complete the Work, considering restrictions of access and availability of Work areas, and availability and use of manpower, materials, and equipment. The preliminary as-planned schedule shall show the activity duration, sequencing, and interdependencies for the following:
         1. Preparation of Shop Drawings and material samples.
         2. Review and approval of Shop Drawings and material samples.
         3. Permitting.
         4. Material procurement.
         5. Fabrication.
         6. Temporary works.
         7. Installation.
         8. Inspection/testing; and
         9. Handover.
      4. Each activity shall be coded by the performing entity such as a particular Sub-Contractor, supplier, the Consultant, etc.
      5. The activities defined in the preliminary as-planned schedule shall represent the planned durations in anticipation of normal manpower and equipment utilization in durations of whole working days. Except for non-construction activities, such as procurement, delivery or submittals, no activity durations shall exceed fifteen (15) working days unless approved by the Consultant. The durations shall be determined based upon resource planning under contractually defined on-site work conditions. In calculating activity durations, normal inclement weather shall be considered. The Contractor shall schedule the Work to minimize the effect of adverse weather, and to allow for protection of the Site from such effects.
      6. The total number of activities and the distribution of activities shall reflect the complexity of the Work and shall be finite, measurable, identify a specific function and identify a trade responsible for its completion.
      7. Prepare a narrative to accompany the preliminary as-planned schedule that provides a detailed description of the labour, materials, plant, means and methods that the Contractor intends to utilize in carrying out the Work to achieve the planned rates of production required to support the activity durations shown in the schedule. The narrative shall also provide explanations supporting the use of lead-lag relationships and, where permitted, constrained dates.
   6. PRELIMINARY AS-PLANNED SCHEDULE SUBMISSION AND REVIEW
      1. Within fifteen (15) working days after Contract award, submit to the Consultant:
         1. One (1) electronic copy of the preliminary as-planned schedule, clearly labelled with data date, specific update, and person responsible for update.
         2. Two (2) hard copies of bar chart identifying coding, activity durations, early/late and start/finish dates, total float, completion as percentile, current status and budget amounts.
         3. Two (2) hard copies of network diagram showing coding, activity sequencing (logic), total float, early/late dates, current status and durations.
         4. Two (2) hard copies of written narrative as described in paragraph 1.5.7 above.
      2. The Owner and the Consultant will review and return the preliminary as-planned schedule within five (5) working days after receipt.
      3. The preliminary as-planned schedule must be acceptable in principle to the Owner and the Consultant, prior to the release of the first progress payment.
   7. FINAL AS-PLANNED SCHEDULE AND CASH FLOW
      1. The Contractor shall submit all revisions and/or additional information requested by the Owner or the Consultant pursuant to their review of the preliminary as-planned schedule if the Consultant considers that these additions are necessary for the preliminary as-planned schedule to comply with the requirements of this section. The required revisions must be made, and the as-planned schedule finalized to the satisfaction of the Owner and the Consultant (whereupon it will become the final as-planned schedule, against which progress will be measured) within thirty (30) working days after Contract Award.
   8. FINAL AS-PLANNED SCHEDULE SUBMISSION, REVIEW AND APPROVAL
      1. The Consultant will accept the final as-planned schedule if it demonstrates that the Work will be performed in an orderly manner and in conformity with the Contract Time, subject to the constraints set out in the Contract, but such acceptance will neither impose on the Owner or the Consultant responsibility for the sequencing, scheduling or progress of the Work nor interfere with or relieve the Contractor from the Contractor’s full responsibility therefore. Acceptance of the final as-planned schedule or any subsequent update by the Owner shall not be construed as a confirmation that the schedule is a reasonable plan for performing the Work.
      2. Acceptance of final as-planned schedule showing scheduled Contract duration shorter than specified Contract duration does not constitute change to Contract Time.
      3. Consider final as-planned schedule showing Work completed in less than specified Contract duration, to have float.
   9. COMPLIANCE WITH CONTRACT SCHEDULE
      1. The Contractor shall adhere to latest schedule approved by the Consultant.
      2. The express or implied acceptance by the Owner or the Consultant of the final as-planned schedule and any progress schedules shall not constitute an approval or acceptance of the Contractor’s construction means, methods, or sequencing or its ability to complete the work in a timely manner and shall not place any obligation or responsibility on Owner towards the Contractor nor in any way limit the Contractor’s obligations and responsibilities.
   10. PROGRESS MONITORING
       1. Monitor progress of Work in detail to ensure integrity of critical path, by comparing actual completions of individual activities with their scheduled completions and reviewing progress of activities that have started but are not yet completed. Monitoring should be undertaken sufficiently often so that causes of delays are immediately identified and removed if possible.
       2. On an ongoing basis, record “progress to date” on copy of schedule to be available at the Site. Inspect Work with the Owner and the Consultant at least bi-weekly to establish progress on each current activity.
   11. UPDATES AND REVISIONS TO SCHEDULE
       1. The Contractor’s schedule is to be updated and resubmitted to the Consultant as a progress schedule at least once per month, on a date to be mutually agreed by the Contractor and the Consultant, together with the related data and reports required by this Section. Updated schedule is to include a two (2) week look-ahead schedule in the form of a bar chart.
       2. Each progress schedule shall record and report actual completion and/or start dates for each completed or in-progress activity, activity percent complete for in-progress activities and forecast completion dates for all activities that are not yet complete. Do not automatically update actual start and finish dates by using default mechanisms found in scheduling software. The progress schedule will show the projected completion date of the Work based on the progress information inserted into it, without changes to the schedule logic or the original duration of any activity. The Contractor shall use the retained logic option when executing schedule calculations. The final as-planned schedule (or an approved revision thereto) will be shown as a target schedule to indicate whether the current progress schedule remains on target, has slipped or is ahead of schedule.
       3. The Contractor may then, in a second and subsequent update to the progress schedule, incorporate any logic and duration changes that represent its revised planning, provided all such changes are identified and documented in the schedule narrative required to accompany the progress schedule, and are agreed to by the Consultant.
       4. If it appears that the progress schedule submitted by the Contractor no longer represents the actual sequencing and progress of the Work, the Consultant may instruct the Contractor to revise the progress schedule.
       5. In order to improve the schedule, eliminate unforeseen problems or reduce the time required for an activity, modifications to the schedule may be suggested by the Contractor, Sub-Contractors, Owner, or Consultant during the execution of the Contract, and such modifications may be implemented by mutual agreement. The Contractor shall submit to the Consultant for acceptance proposed adjustments to the final as-planned schedule or any subsequent updates that will not change the Contract Time.
       6. If, at any time, the work is behind schedule with respect to the progress schedule currently in force, and if the Consultant believes there is a risk of the Work not being completed within the Contract Time as a result of such delay, the Contractor shall take all necessary measures to make up for such delay either by increasing staff, plant or facilities, or by amending its work methods, whichever is applicable.
       7. In all cases of delay or potential delay, the Contractor shall keep the Owner and the Consultant informed of its intentions with regard to mitigation of such delay and the Owner’s Consultant may, if it is deemed necessary, require the Contractor to revise all or part of its current progress schedule.
       8. The current Contract Schedule can only be revised as agreed with the Owner and the Consultant by Change Order or an accepted revision to the logical sequence of described construction operations.
       9. Once accepted, the revised schedule will become the current Contract Schedule against which progress is reported and to which subsequent updates will be compared. The new Contract Schedule will be clearly identified to show it as the current Contract Schedule.
       10. Where the progress schedule shows completion of the Contract, or of any interim milestone, later than the Contract or milestone completion dates, acceptance of such progress schedules and of the monthly progress report will not constitute acceptance of the delay by the Consultant or the Owner.
   12. EXTENSIONS OF TIME
       1. Float shall not be for the exclusive use of either the Contractor or the Owner. Extensions to the Contract Time will be granted only to the extent that appropriate adjustments to the duration of the affected activity exceed the total float time along the affected paths of the progress schedule in force at the time a Change Order or Change Directive is issued.
       2. Submit to the Consultant, justification, project schedule data and supporting evidence for approval of extension to the Contract Time or interim milestone date when required. Include as part of supporting evidence:
          1. Written submission of proof of delay based on revised activity logic, duration, and costs, showing time impact analysis illustrating influence of each change or delay relative to approved Contract Schedule.
          2. Prepared schedule indicating how change will be incorporated into the overall logic diagram. Demonstrate perceived impact based on date of occurrence of change and include status of construction at that time.
          3. Other supporting evidence requested by the Consultant.
   13. PROGRESS REPORTS
       1. Monthly progress reports shall be prepared by the Contractor and submitted to the Consultant in the form of two (2) hard copies, plus one (1) electronic copy of the relevant schedule files, to demonstrate how the Work is actually progressing and the planned and detailed sequencing of the Work at the time of the report. The cut-off date for the monthly progress report shall be as instructed by the Consultant and the report shall be submitted no later than ten (10) Working Days after the cut-off date and accompanying the monthly progress draw.
       2. Each monthly progress report shall be in a format acceptable to the Owner, and shall be arranged according to the following headings and sub-headings:
          1. Executive Summary.
             1. Activity to (date).
             2. Forecast activity to (date).
          2. Project Cost Information:
             1. Budget Summary.
             2. Cash Allowance Log.
             3. Change Order Log.
          3. Project Data:
             1. Project Schedule.
             2. Shop Drawing Log.
             3. Site Inspection Log.
             4. Site Testing Log.
          4. Critical Issues Log.
          5. Site Photos.
       3. Each monthly progress report shall include:
          1. An updated progress schedule, comparing actual and target progress for all milestones and activities. Sort activities by activity identification number and accompany with descriptions. List early and late start and finish dates together with durations, codes, and float.
          2. Criticality report listing activities and milestones with up to five (5) days of total float used as first sort for ready identification of near critical paths through entire project. List early and late starts and finishes dates, together with durations, codes, and float for critical activities.
          3. Progress report in early start sequence, listing for each trade, activities due to start, to be underway, or finished within two months from monthly update date. List activity identification number, description, and duration. Provide columns for entry of actual start and finish dates, duration remaining and remarks concerning action required.
          4. A schedule narrative, including:
             1. Detailed descriptions of progress, including each stage of procurement, fabrication, delivery to site, construction, installation, and testing.
             2. Discussion of the basis for any work sequencing, logic, interdependencies, or original activity duration revisions incorporated into an updated progress schedule; and
             3. Comparisons of actual and planned progress, with a brief commentary on any actual or forecast delays or problems that might have an impact on the completion. Date of the Work, and a discussion of the measures being (or to be) adopted to overcome these.
          5. Charts showing the status of submittals, permits and approvals, utility relocations, purchase orders, manufacturing/fabrication, and construction.
          6. For each fabricated item, the name and location of the fabricator, percentage progress, and the actual or expected dates of commencement of fabrication, Contractor’s inspections, tests, and delivery.
          7. Progress photographs taken, prepared, and submitted in formats specified, all in accordance with Section 01 33 00 – Submittal Procedures.
          8. RFI log.
       4. Timely submission of updates is of significant and crucial importance to the management of this project. Lack of or late receipt of updates diminishes their value to the Owner and the Consultant. Therefore, if the Contractor fails to submit any progress schedule or required revision to a progress schedule within the prescribed time period, the Owner, in its sole discretion, may hold back subsequent progress payments until the updated schedule is submitted or the revision is accepted.
   14. REVIEW OF MONTHLY PROGRESS REPORTS
       1. The monthly progress reports and progress schedules will be used by the Owner and the Consultant to monitor the Contractor’s performance against the current Contract Schedule.
2. Products

Not Used

1. Execution

Not Used

end of section